Yarmouth Quadrangle, Maine

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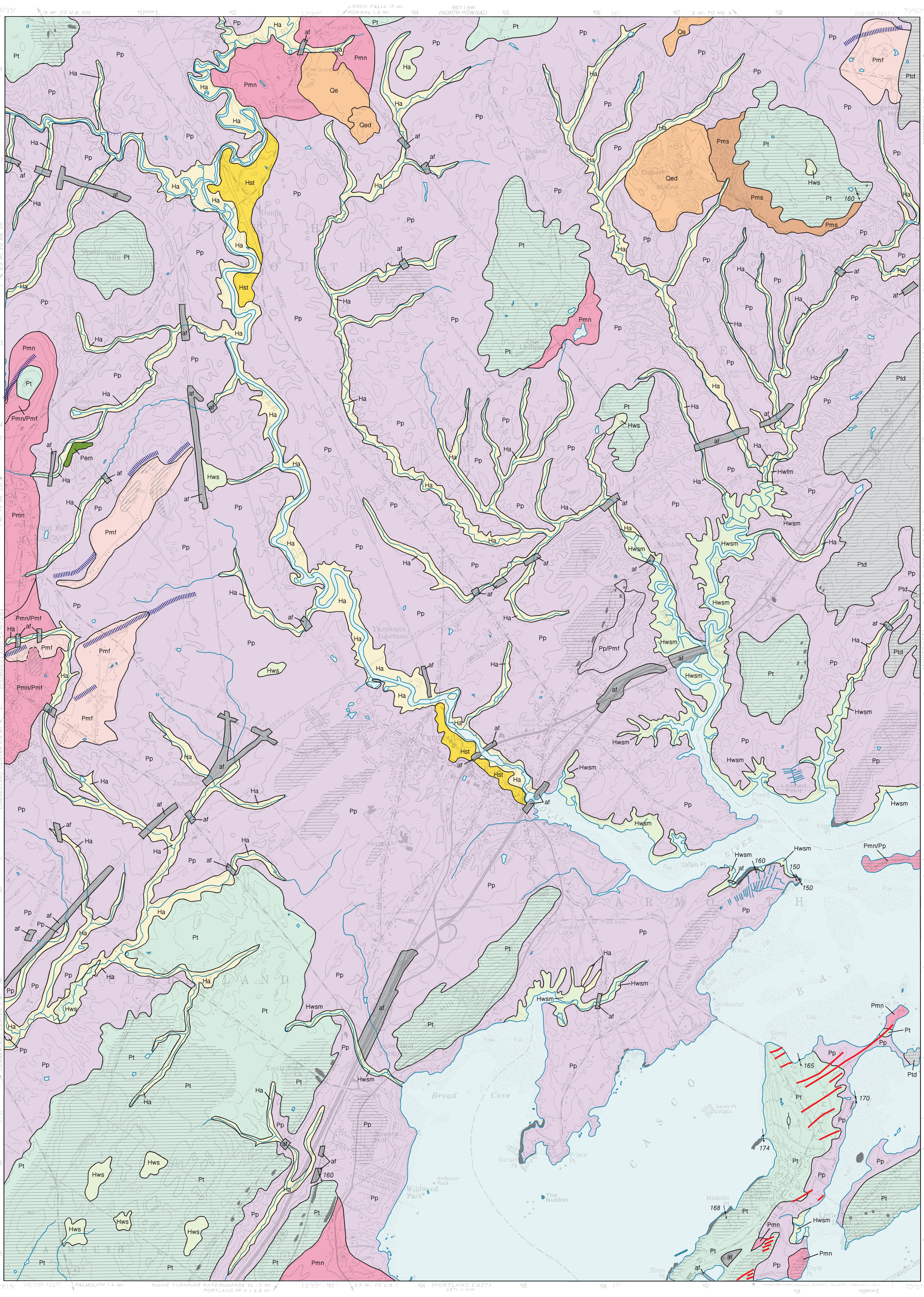
For additional information,
see Open-File Report 99-136.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping by Michael J. Retelle completed during the 1995-1996 field seasons; funding for this work provided by the U. S. Geological Survey COGEOMAP program. Geologic unit designations and contacts revised and matched to adjacent quadrangles in 1999 by MGS geologists.

Quadrangle Location

SCALE 1 : 24,000

1 MILE | 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET | 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Yarmouth quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

HOLOCENE DEPOSITS

Ha — **Stream alluvium** - Sand, silt, and minor amounts of gravel deposited on flood plains of modern streams.

Hst — **Stream terraces** - Flat alluvial benches situated above modern flood plains of streams. Materials forming the depositional terraces include gravel, sand, silt, and clay. Step-like morphology was created by downcutting of the stream through previously deposited material, of glacial or postglacial origin and age.

Hws — **Wetland, swamp** - Peat and fine-grained inorganic sediment. Poorly drained area with standing water common.

Hwfm — **Wetland, freshwater marsh** - Peat and fine-grained inorganic sediment. Poorly drained grassland with standing water common.

Hwsm — **Wetland, saltwater marsh** - Peat, clay, silt, and sand deposited in low-lying areas adjacent to tidal inlets, tidal channels, and tidal flats.

LATE PLEISTOCENE TO HOLOCENE DEPOSITS

Qe / Qed — **Eolian deposits** - Qe: Discontinuous sands occurring as blanket deposits, and other windblown sand deposits with indistinct morphology. Includes fine to medium sand and silty sand. Qed: Eolian sand dunes that are currently active or were active in early postglacial time. Sand dunes in the Desert of Maine.

PLEISTOCENE DEPOSITS

Pmn — **Marine nearshore deposits** - Sand and gravel deposits formed as beaches, and shallow marine sand bodies formed during marine submergence and regression.

Pp — **Presumpscot Formation** - Fine-grained marine mud (silt and clay with local sandy beds and lenses), locally with marine fossils and dropstones. Deposited in deeper, quieter water during the marine submergence of the coastal lowland.

Pmf — **Marine fan** - Stratified gravel and sand deposited on the seafloor at the glacier margin during marine submergence. Occurs as wedge and mound-shaped deposits.

Pms — **Marine shoreline deposits** - Predominantly sand and gravel. Consists of beach deposits formed during regressive phase of marine submergence.

Pem — **End moraine** - Ridge of till and/or sand and gravel deposited at the margin of the late Wisconsinan ice sheet.

Pt — **Till** - Poorly sorted mixture of gravel, sand, silt, and clay deposited directly by the action of glacial ice.

Ptd — **Thin drift areas, undifferentiated** - Areas with less than ten feet of drift covering bedrock. Till overlies bedrock on hillslopes and ridge crests; Presumpscot Formation silty clays are present in depressions; and nearshore deposits locally overlie till, Presumpscot Formation, and bedrock on hillslopes and at the base of these slopes.

Bedrock - Solid dots indicate individual outcrops of ledge exposed at the ground surface. Horizontal ruled pattern indicates areas where bedrock is covered by a thin veneer of surficial sediments.

af — **Artificial fill** - Mixtures of till, gravel, sand, clay, and/or artificial materials transported and dumped to form elevated sections of roadways and other filled areas.

Gravel pit - Active or inactive pit, generally on sand and gravel. Topography of these areas has been obscured by mining operations.

Contact - Indicates boundary between adjacent map units.

135 — **Glacial striation or groove** - Arrow shows direction of former ice movement. Dot marks point of observation.

End moraine - Ridge of till, sand, and gravel deposited and/or deformed by glacial ice.

Ice margin position - Line shows an approximate position of part of the glacier margin during ice retreat, based on ice-contact topography, end moraines, and/or meltwater channels.

Stream terrace scarp - Scarp separating different levels of stream terraces. Hachures on downslope side.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Retelle, M. R., 1999, Surficial geology of the Yarmouth 7.5-minute quadrangle, Cumberland County, Maine: Maine Geological Survey, Open-File Report 99-105, 8 p.
2. Retelle, M. R., 1999, Surficial materials of the Yarmouth quadrangle, Maine: Maine Geological Survey, Open-File Map 99-65.
3. Neil, C. D., 1999, Significant sand and gravel aquifers of the Yarmouth quadrangle, Maine: Maine Geological Survey, Open-File Map 99-28.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.